

THE CLAIMS

What is claimed:

- 1 1. An implant for fixation of a bone comprising:
2 a shaft having a proximal end and a distal end, the shaft defining a longitudinal axis
3 between the proximal end and the distal end; and
4 a plurality of blades disposed on at least a portion of the shaft and helically twisted
5 about the longitudinal axis, the plurality of blades having a proximal end and a distal end;
6 wherein at least one of the blades has a variable blade width that varies in a direction
7 along the longitudinal axis.
- 1 2. The implant of claim 1, wherein the variable blade width increases in a
2 direction from the blade proximal end toward the blade distal end.
- 1 3. The implant of claim 1, wherein at least one of the blades has a variable
2 blade height that varies in a direction along the longitudinal axis.
- 1 4. The implant of claim 1, wherein at least one of the blades has a substantially
2 constant blade width.
- 1 5. The implant of claim 1, wherein the plurality of blades twist about 90° about
2 the longitudinal axis.
- 1 6. The implant of claim 3, wherein the variable blade height increases in a
2 direction from the blade proximal end toward the blade distal end.
- 1 7. The implant of claim 3, wherein at least one of the blades has a substantially
2 constant blade height.
- 1 8. The implant of claim 1, wherein the plurality of blades comprises:
2 at least first and second blades substantially diametrically opposed from one another
3 about the longitudinal axis; and
4 at least third and fourth blades substantially diametrically opposed from one another
5 about the longitudinal axis;
6 wherein at least one of the first and second blades has a variable blade width that
7 increases in a direction along the longitudinal axis, and at least one of the third and fourth
8 blades has a variable blade height that increases in a direction along the longitudinal axis.

1 9. The implant of claim 6, wherein the blade height of the variable blade is
2 substantially zero at the blade proximal end.

1 10. The implant of claim 9, wherein:
2 at least one of the first and second blades has a substantially constant blade height;
3 and
4 at least one of the third and fourth blades has a substantially constant blade width.

1 11. The implant of claim 10, wherein:
2 the first and second blades have a variable blade width that increases in a direction
3 along the longitudinal axis, and a substantially constant blade height;
4 the third blade has a blade height that increases in a direction along the longitudinal
5 axis, and a substantially constant blade width; and
6 the fourth blade has a substantially constant blade height, and a substantially
7 constant blade width.

1 12. The implant of claim 11, wherein the first and second blades are out of phase
2 with the third and fourth blades by about 90° about the longitudinal axis.

1 13. The implant of claim 1, wherein the implant is configured and dimensioned
2 for implantation in a femoral head.

1 14. The implant of claim 1, further comprising a cannulation extending from the
2 proximal end to the distal end, the cannulation configured and dimensioned to receive a
3 guide wire.

1 15. The implant of claim 1, wherein the distal end is configured and dimensioned
2 for attachment to an insertion device.

1 16. An implant for fixation of a bone comprising:
2 a shaft defining a longitudinal axis of the implant, the shaft including a bladed
3 portion and a non-bladed portion, the bladed portion and the non-bladed portion each
4 having a diameter;
5 a plurality of blades disposed on the bladed portion and helically twisted about the
6 longitudinal axis, wherein the maximum diameter of the bladed portion is smaller than the
7 maximum diameter of the non-bladed portion.

1 17. The implant of claim 16, wherein the non-bladed portion includes a tapered
2 region located substantially adjacent the bladed portion, wherein the tapered region defines
3 a tapered region diameter that decreases in a direction toward the bladed portion.

1 18. The implant of claim 17, wherein the tapered region is configured and
2 dimensioned to provide even stress distribution over the tapered region.

1 19. The implant of claim 17, wherein the tapered region is concave.

1 20. The implant of claim 17, wherein the tapered region provides uniform
2 bending of the implant.

1 21. The implant of claim 17, wherein the tapered region further defines a neck
2 diameter at a point substantially adjacent the blades, wherein the neck diameter is smaller
3 than the blade diameter.

1 22. The implant of claim 17, wherein the implant has proximal and distal ends
2 located on the longitudinal axis, and the bladed portion is located substantially adjacent one
3 of the ends.

1 23. The implant of claim 16, wherein the implant is configured and dimensioned
2 for implantation in a femoral head.

1 24. The implant of claim 16, further comprising a cannulation extending
2 substantially along the longitudinal axis of the shaft, the cannulation configured and
3 dimensioned to receive a guide wire.

1 25. An implant for fixation of a bone comprising:
2 a shaft having a proximal end and a distal end, the shaft defining a longitudinal axis
3 between the proximal end and the distal end; and
4 a plurality of blades disposed on at least a portion of the shaft and helically twisted
5 about the longitudinal axis, the plurality of blades having a proximal end and a distal end;
6 wherein at least one of the blades has a variable blade height that varies in a
7 direction along the longitudinal axis.

1 26. The implant of claim 25, wherein the variable blade height increases in a
2 direction from the blade proximal end toward the blade distal end.

1 27. The implant of claim 26, wherein the variable blade height is substantially
2 zero at the blade proximal end.

1 28. The implant of claim 25, wherein at least one of the blades has a
2 substantially constant blade height.

1 29. The implant of claim 25, wherein at least one of the blades has a variable
2 blade width that varies in a direction along the longitudinal axis.

1 30. The implant of claim 29, wherein the variable blade width increases in a
2 direction from the blade proximal end toward the blade distal end.

1 31. The implant of claim 25, wherein at least one of the blades has a
2 substantially constant blade width.

1 32. The implant of claim 25, wherein the plurality of blades twist about 90°
2 about the longitudinal axis.

1 33. The implant of claim 25, wherein the implant is configured and dimensioned
2 for implantation in a femoral head.

1 34. The implant of claim 25, further comprising a cannulation extending from
2 the proximal end to the distal end, the cannulation configured and dimensioned to receive a
3 guide wire.

1 35. The implant of claim 25, wherein the distal end is configured and
2 dimensioned for attachment to an insertion device.